

**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

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(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 030976/pct	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. <b>PCT/AU2003/001080</b>	International Filing Date (day/month/year) <b>25 August 2003</b>	Priority Date (day/month/year) <b>17 October 2002</b>
International Patent Classification (IPC) or national classification and IPC <b>Int. Cl. 7 F24J 002/38, 002/52</b>		
Applicant <b>PATTERSON, Michael, Terrence</b>		

<ol style="list-style-type: none"> <li>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</li> <li>2. This REPORT consists of a total of 3 sheets, including this cover sheet.</li> </ol> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 2 sheet(s).</p>
<ol style="list-style-type: none"> <li>3. This report contains indications relating to the following items:           <ul style="list-style-type: none"> <li>I <input checked="" type="checkbox"/> Basis of the report</li> <li>II <input type="checkbox"/> Priority</li> <li>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li>IV <input type="checkbox"/> Lack of unity of invention</li> <li>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI <input type="checkbox"/> Certain documents cited</li> <li>VII <input type="checkbox"/> Certain defects in the international application</li> <li>VIII <input type="checkbox"/> Certain observations on the international application</li> </ul> </li> </ol>

Date of submission of the demand <b>29 April 2004</b>	Date of completion of the report <b>4 February 2005</b>
Name and mailing address of the IPEA/AU <b>AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929</b>	Authorized Officer  <b>A Davies</b> Telephone No. (02) 6283 2072

**I. Basis of the report**

## 1. With regard to the elements of the international application:\*

the international application as originally filed.

the description, pages 1-12 as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of

the claims, pages , as originally filed,  
pages , as amended (together with any statement) under Article 19,  
pages filed with the demand,  
pages 13,14 received on 9 August 2004 with the letter of 9 August 2004

the drawings, pages 1-11 as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of

the sequence listing part of the description:  
pages , as originally filed  
pages , filed with the demand  
pages , received on with the letter of

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

the language of publication of the international application (under Rule 48.3(b)).

the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

contained in the international application in written form.

filed together with the international application in computer readable form.

furnished subsequently to this Authority in written form.

furnished subsequently to this Authority in computer readable form.

The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4.  The amendments have resulted in the cancellation of:

the description, pages

the claims, Nos.

the drawings, sheets/fig.

5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims	YES
	Claims 1-9	NO
Inventive step (IS)	Claims	YES
	Claims 1-9	NO
Industrial applicability (IA)	Claims 1-9	YES
	Claims	NO

**2. Citations and explanations (Rule 70.7)**

EP, 1241416, A2 (Cantore) 18 September 2002

WO, 1992/011496, A1 (Ackeret) 9 July 1992

US, 5622078, A (Mattson) 22 April 1997

The first citation discloses the use of the thermal expansion of a liquid when exposed to sunlight or ambient temperature to drive a piston in a cylinder to thereby orient a solar collector with respect to the sun. Clearly this teaches a liquid having a boiling point higher than the working temperature of the apparatus.

Now as pointed out in the attorney's letter this citation does not have an expansion chamber which is situated on the western side of the collector as required by amended claim 1. The attorney submits that because of this feature on a partially cloudy day the response of the device to the reappearance of the sun will be rapid. This difference, however, appears to be more in the class of an optimisation and as such is insufficient to convey novelty or an inventive step. Any skilled addressee will seek to position the various mechanical features of the device to maximise its efficiency and performance.

## AMENDED CLAIMS

[received by the International Bureau on 28 November 2003 (28.11.03);  
Claims 1-9 replaced by amended claims 1-9 (2 pages)]

1. A solar tracking apparatus which is movable from a morning position to an evening position, the apparatus comprising a support means to which a solar device can be supported, a cylinder, the cylinder including a ram which is extendable from and retractable into the cylinder, an expansion chamber which forms part of or which is in fluid connection with the cylinder, a liquid in the cylinder and the expansion chamber, the liquid having a boiling point which is greater than the maximum operating temperature of the cylinder and the expansion chamber, a return means to cause the apparatus to be returned to the morning position, and rotation means associated with the ram to rotate the apparatus and the expansion chamber from the morning position to the evening position upon extension of the ram.

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2. The apparatus of claim 1, wherein the support means comprises a supporting frame.

3. The apparatus of claim 2, wherein the solar device comprise photovoltaic cells.

4. The apparatus of claim 1, wherein the expansion chamber comprises a hollow tube which is separate to the cylinder and attached thereto.

5. The apparatus of claim 1, wherein the liquid is selected from the group consisting of a mineral oil, a plant oil, and an alcohol with the proviso that the boiling point of the liquid is higher than the maximum operating temperature of the apparatus.

6. The apparatus as claimed in claim 1, wherein the return means is a spring.

7. The apparatus of claim 1, wherein the rotation means is a mechanical crank assembly.

8. The assembly of claim 7, wherein the mechanical crank assembly comprises a pivot tube, the pivot tube convertible about a substantially horizontal axis, an L shaped lever arm attached to the pivot tube, attachment means of the ram to attach the ram to the lever arm such that extension and retraction of the ram will cause rotation of the pivot tube, the pivot tube being attached to the support means to rotate the support means

REPLACED BY  
AMENDED CLAIMS

upon rotation of the pivot tube.

9. The assembly of claim 8, comprising a vertical support post, the perfect tube being pivotally supported by the support post .

REPLACED BY  
ART 34 AMDT

REPLACED BY  
ART 34 AMENDT

## CLAIMS:

1. A solar tracking apparatus which is movable from a morning position to an evening position, the apparatus comprising a support means to which a solar device can be supported, a cylinder, the cylinder including a ram which is extendable from and retractable into the cylinder, an expansion chamber which forms part of or which is in fluid connection with the cylinder, a liquid in the cylinder and the expansion chamber, the liquid having a boiling point which is greater than the maximum operating temperature of the cylinder and the expansion chamber, a return means to cause the apparatus to be returned to the morning position, and rotation means associated with the ram to rotate the apparatus from the morning position to the evening position upon extension of the ram.
2. The apparatus of claim 1, wherein the support means comprises a supporting frame.
- 15 3. The apparatus of claim 2, wherein the solar device comprise photovoltaic cells.
4. The apparatus of claim 1, wherein the expansion chamber comprises a hollow tube which is separate to the cylinder and attached thereto.
- 20 5. The apparatus of claim 1, wherein the liquid is selected from the group consisting of a mineral oil, a plant oil, and an alcohol with the proviso that the boiling point of the liquid is higher than the maximum operating temperature of the apparatus.
6. The apparatus as claimed in claim 1, wherein the return means is a spring.
- 25 7. The apparatus of claim 1, wherein the rotation means is a mechanical crank assembly.
8. The assembly of claim 7, wherein the mechanical crank assembly comprises a pivot tube, the pivot tube convertible about a substantially horizontal axis, an L shaped lever arm attached to the pivot tube, attachment means of the ram to attach the ram to the lever arm such that extension and retraction of the ram will cause rotation of the pivot tube, the pivot tube being attached to the support means to rotate the support means

upon rotation of the pivot tube.

9. The assembly of claim 8, comprising a vertical support post, the perfect tube being pivotally supported by the support post .

REPLACED BY  
ART 34 AND 1